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ABSTRACT

Developed as part of a 110-hour high school course on general metals, this 50 minute lesson is designed to enable students to: (1) name the parts of the tape rule; (2) determine what size tape rule to use for a given task; (3) measure correctly with a tape rule or ruler; and (4) dimension correctly for a piece of metal or wood. The lesson plan begins with information on the course for which the lesson was designed; equipment and audiovisual aids needed; requirements for student materials; course objectives; bibliographic references; and special remarks for the instructor. Next, a step-by-step outline of the instructor's presentation is provided in a format indicating the length of time and the equipment or other aids necessary for each step of the lesson. Transparency masters, tests, posttests and answer keys are included. (PAA)

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HOW TO USE A TAPE RULE

General Metals I,
Lesson Plan

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LESSON PLAN

LESSON PLAN NO.	INSTITUTION / AGENCY: KAILUA HIGH SCHOOL	PAGE 1 OF 19 PAGES

COURSE OF INSTRUCTION AND COURSE NUMBER:	TOTAL HOURS:	LESSON TITLE:
GENERAL METALS I PI20	110 HOURS	HOW TO USE A TAPE RULE

DAY AND DATE OF INSTRUCTION:	HOURS	PLACE:
NOV. 11, 1986	50 MIN.	METAL SHOP

NO. OF STUDENTS:	REHEARSAL:	INSTRUCTOR AND ASSISTANTS:	STUDENT MATERIALS AND DRESS:
10		FLOYD HIGA	CASUAL ATTIRE, COVERED SHOES PENCIL

REFERENCES:

Self, Charles. The Complete Handbook of Woodworking Tools and Hardware. Blue Ridge Summit, Pa. TAB Books, 1983. p. 114.

Walker, John. Modern Metalworking. South Holland, Illinois. The Goodheart-Willcox Company, Inc. 1976. p. 4-1

EQUIPMENT AND AUDIO-VISUAL AIDS:

1. BLACKBOARD
2. CHALK
3. OVERHEAD PROJECTOR
4. SCREEN
5. HAND-OUTS
6. TRANSPARENCIES
7. TRANSPARENCY PENS
8. BLOCKS TO MEASURE
9. TAPE RULE FOR EACH STUDENT
10. 3/4" TAPE RULE FOR DEMONSTRATION

OBJECTIVES: By the end of this lesson, the student should be able to...

1. Name the parts of the tape rule. (100%)
2. Determine what size tape rule to use. (100%)
3. Measure with a tape rule or ruler. (80%)
4. Dimension the correct way for a piece of metal, and a piece of wood. (90%)

SPECIAL REMARKS:

1. Issue one (1) tape rule to each student.
2. Issue one (1) piece of wood or metal to each student.
3. Request overhead projector & screen.

LESSON PLAN NO. _____

PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
I. INTRODUCTION	10	
A. OPENING PHRASE:		
1. Today we will learn how to use a tape rule. We will learn the names of the parts of the rule. We will learn what tape rule length will be the best for the job you are working on. We will learn how to read the rule. And, we will learn how to write down dimensions.		
2. What is a tape rule? a. A flexible metal ruler in a case		
3. What a tape rule is a. A measuring device		
4. What a tape rule is not a. It is not a toy cricket b. It is not a yo-yo		Demonstration
B. OBJECTIVES:		
1. By the end of this lesson, the student should be able to... a. Name the parts of the tape rule. (100%) b. Determine what size (length) tape rule to use. (ie. 6', 8', 10', 12', 25', 50'. 100%) c. Measure with a tape rule or ruler. (80%) d. Dimension the correct way for a piece of metal, and a piece of wood. (90%)		
C. REASONS:		
1. Some of you may be wondering "why do we have to know how		

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
to read a tape rule for. What's the reason." Our country is based on weights and measurements. Almost everything is weighed and/or measured. 2. Babies, also you as a baby was weighed and measured. 3. Physical objects a. Items in classroom 1. Desk 2. Doors 3. Windows 4. Tables b. Items outside the classroom 1. Cars 2. Houses 3. Stereos		Demonstration: Measure items in classroom
II. Explanation and/or Demonstration A. STATEMENT:	10 min.	
1. Before we learn how to read a tape rule, we must first learn the parts of it. a. THE CASE 1. Houses the tape rule 2. Protects the rule b. THE BLADE 1. The ruler portion 2. Flexible metal c. THE HOOK 1. The chrome piece that "hooks" the object to be measured.		Demonstration Show how to measure circumference

LESSON PLAN NO. _____

PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
2. Made to shake. a. Do not tighten it with a hammer or pliers. b. It will adjust itself to zero. 3. Inside dimension. a. Window casing. 4. Outside dimension. a. Table top.		Show it shake. Let students feel it on their tape rules. Measure window casing. Measure table top.
QUESTION: What is the part that houses and protects the ruler portion called? ANSWER: The case. QUESTION: What is the name of the ruler portion? ANSWER: The blade. QUESTION: What is the chrome piece called? ANSWER: The hook.		Questions to ask students.
d. Summary: 1. We just went over the parts of the tape rule. The case, the blade, and the hook.		Show the parts one more time.
B. WHAT RULE TO USE:	5 min.	
1. Tape rules come in different lenghts, some of the more popular lengths are... a. 6', 8', 10', 12', 25', 50'.		
2. Different blade widths. a. 1/4" to 3/4"		

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OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
3. Use the same rule throughout the project. a. All tape rules are not identical. b. If you can't use the same one, try to stay with the same brand. c. Type of job. 1. Small job/small rule. Easier to handle. 2. Big job/big rule. QUESTION: If you are making something 13'-0" long. What length tape rule would be the BEST one to use? 6', 8', 10', 12', 25', 50'. ANSWER: 25'		
C. READING THE RULE: 1. The rule is divided into different scales or rules. If we break the scales down, they will be easier to understand. a. Eighths rule. 1. Eight equal lines to one inch. b. Sixteenths rule. 1. Sixteen equal lines to one inch. c. Thirty-second rule. 1. Thirty-two equal lines to one inch. d. Further explanation of eighths rule. e. Further explanation of sixteenths rule. f. Further explanation of thirty-second rule. g. Practical portion. 1. Measure piece of wood. QUESTION: In the eighths rule, how many lines are there in one inch?	5 min.	Transparency 1 & hand-out 1 Transparency 2 & hand-out 2 Transparency 3 & hand-out 3 Transparencies 4,5,6, & students will follow on their tape rules. Students will use their tape rules to measure their piece of wood.

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
ANSWER: Eight (8). QUESTION: In the eighths rule, how many lines are there in half an inch? ANSWER: Four (4). D. REVIEW: 1. GO over the parts of the rule. 2. Go over what rule to use. QUESTION: If your project has a piece 6'-1" long. What rule would be the BEST to use? 6', 8', 10', 12', 25', 50'. ANSWER: 8' E. WRITING DIMENSIONS: 1. Length x width: a. Length; first number. b. Width: second number. 2. Feet and inches: a. Feet: one slash ('). b. Inches: two slashes ("). 3. Fractions: a. Use horizontal line not diagonal line. b. Problems with diagonal lines. c. Material waste due to confusion. $1\frac{1}{16}$ or 11/16 4. Dimensioning metal. a. Length is the longer side. b. Width is the shorter side.		Use tape rule as visual aid. Blank transparency & transparency pens. Use throughout this section.

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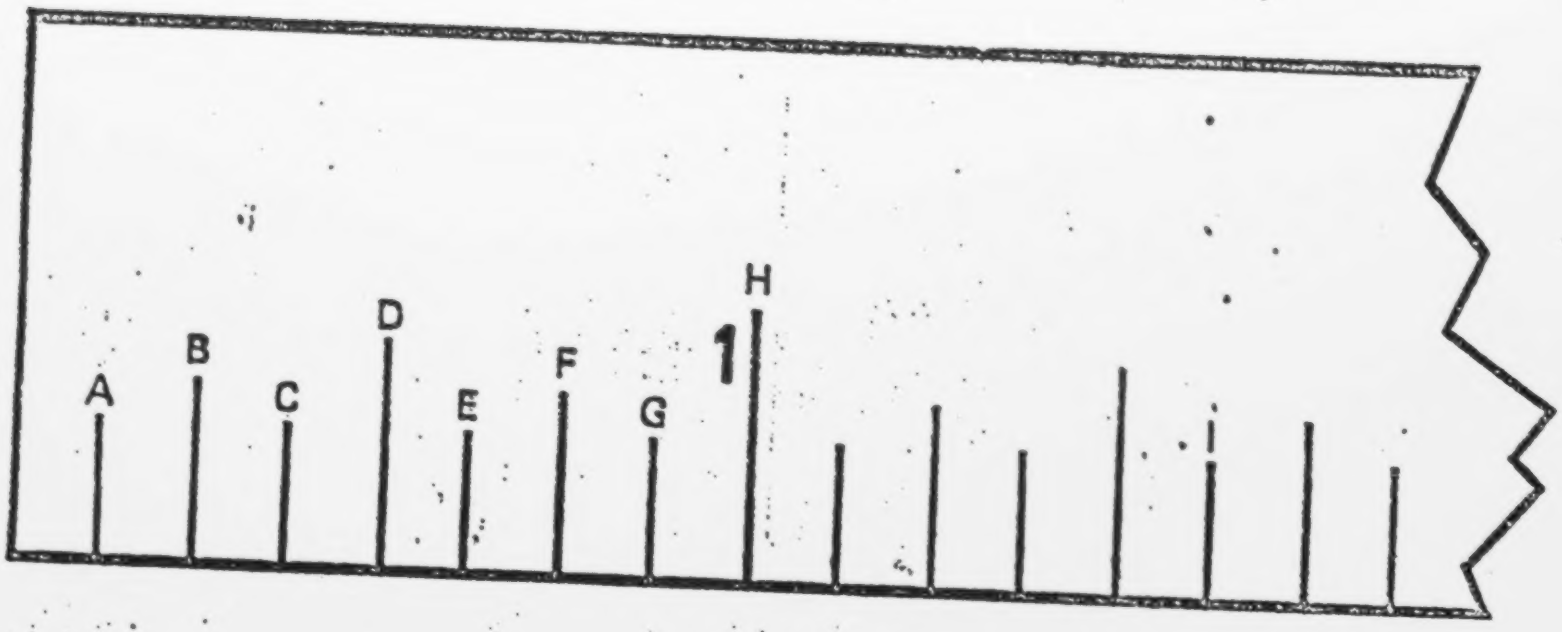
PRESENTATION

OUTLINE OF INSTRUCTION	TIME	METHODS OF INSTRUCTION AND AIDS
5. Dimensioning wood. a. Why, in metals class? 1. Tables or benches with wood top and metal legs. b. How to dimension wood. 1. Grain pattern. 2. Length is with the grain. c. Grain patterns are like roads. 1. "Drive" down with the grains. Tell a joke about the roads near you.		Draw a piece of wood on the chalkboard, and show the grain patterns. Also, let the students see the grain pattern on their piece of wood.
F. SUMMARY:	5 min.	
1. Ask students if they have any questions.		
2. Summarize the lesson. a. Parts of the tape rule. b. Different tape rule lengths. c. Different scales. (ie. 1/8, 1/16, 1/32) d. How to dimension. 1. Metal. 2. Wood.		
3. Closing statement. a. Now that you know how to use a tape rule, I hope that you will go to your nearest hardware store and buy one. But more important, I hope that you will make good use of it.		
G. EXAMINATION:	10 min.	
1. Written test.		Use test provided.

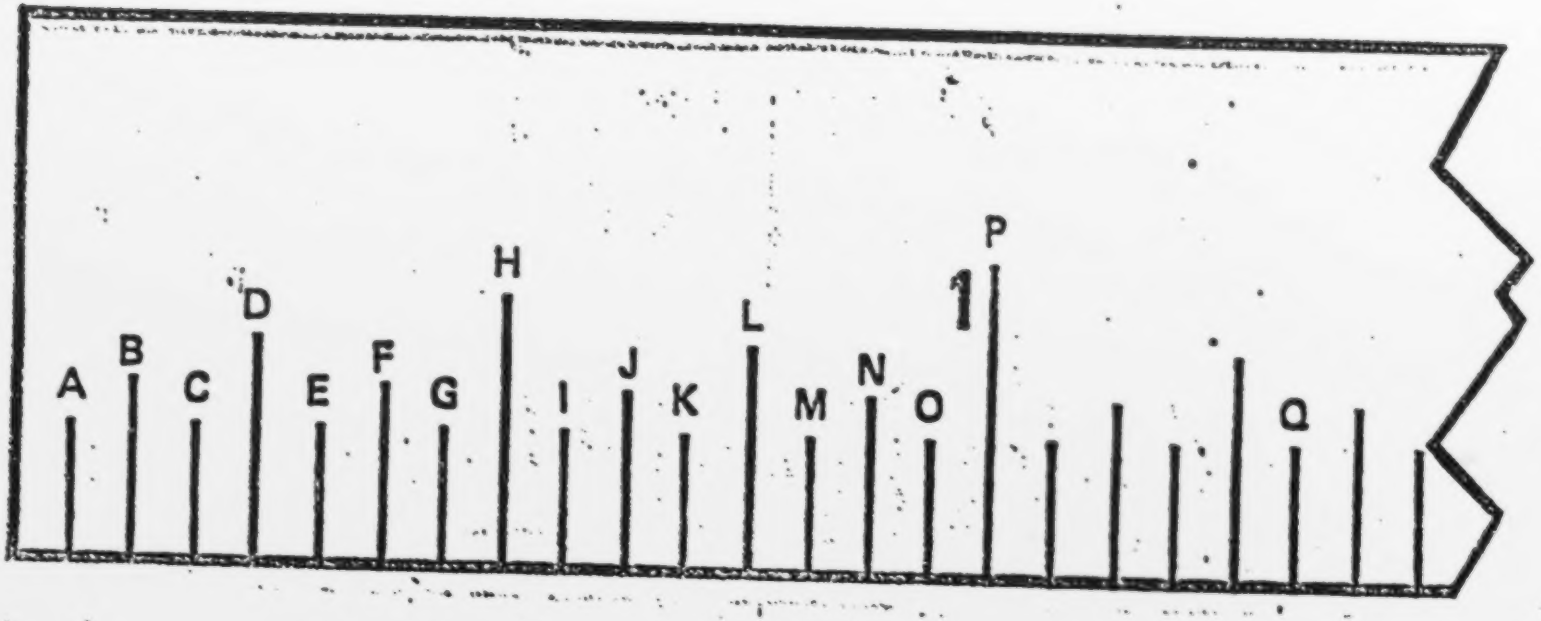
Eighths Rule



A = 1/8, B = 2/8 = 1/4, C = 3/8, D = 4/8 = 1/2,
E = 5/8, F = 6/8 = 3/4, G = 7/8, H = 8/8 = 1,
I = 13/8 = 1 5/8

TM-1
HO-1

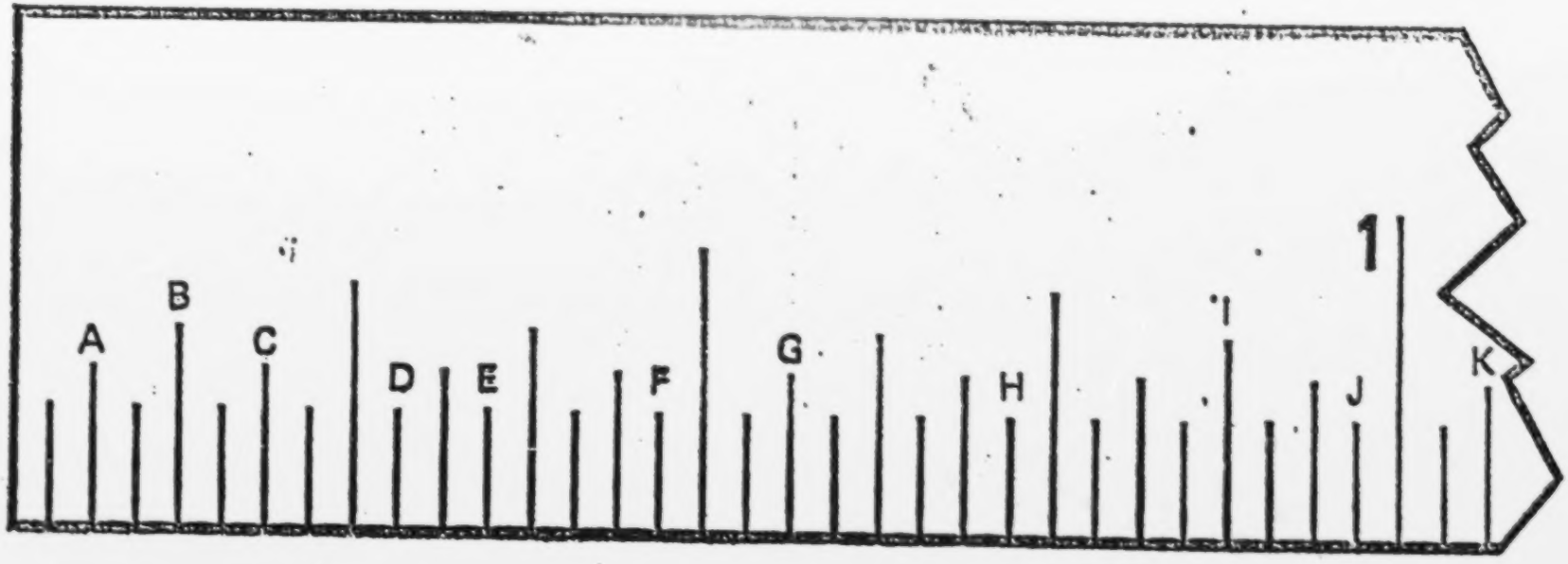
Sixteenths Rule



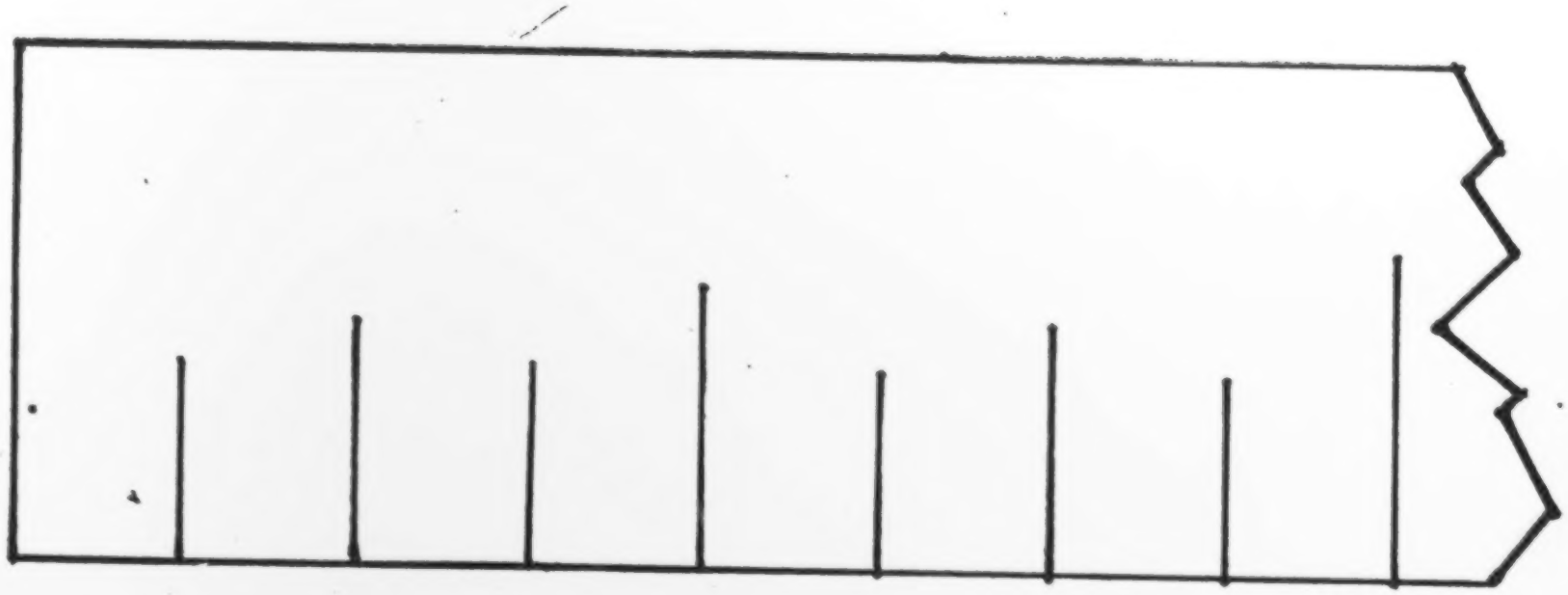
A = 1/16, B = 2/16 = 1/8, C = 3/16, D = 4/16 = 1/4,
E = 5/16, F = 6/16 = 3/8, G = 7/16, H = 8/16 = 1/2,
I = 9/16, J = 10/16 = 5/8, K = 11/16, L = 12/16 = 3/4,
M = 13/16, N = 14/16 = 7/8, O = 15/16, P = 16/16 = 1,
Q = 22/16 = 1 6/16 = 1 3/8

TM-2
HO-2

Thirty-Second Rule



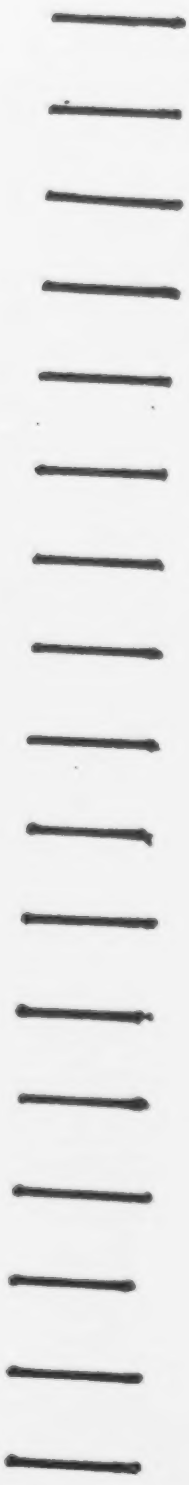
A = 2/32 = 1/16, B = 4/32 = 1/8, C = 5/32, D = 9/32,
E = 11/32, F = 15/32, G = 18/32 = 9/16, H = 23/32,
I = 28/32 = 14/16 = 7/8, J = 31/32,
K = 43/32 = 1 2/32 = 1 1/16



TM-4
OVERLAY

TM-5
OVERLAY

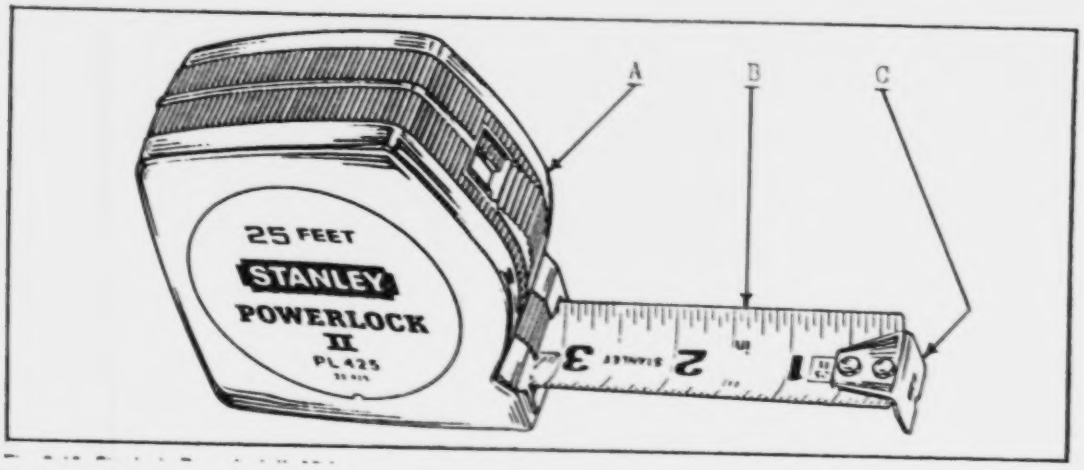
TM-6
OVERLAY



TEST

NAME _____

DATE _____



1. Identify the parts of the tape rule.

   A. _____

   B. _____

   C. _____

2. You are making a project that consist of pieces measuring 6'-1/2" x 4", 10'- 1 1/8" x 2'- 2 1/2", 8'- 11" x 8'- 10". Which tape rule would be the BEST choice ?

   A. 6 feet

   B. 8 feet

   C. 10 feet

   D. 12 feet

   F. 25 feet

   G. 50 feet

ANSWER KEY

(Teacher's Copy)

1. Identify the parts of the tape rule.

   A. The Case

   B. The Blade

   C. The Hook

2. You are making a project that consist of pieces mearsuring 6'- 1/2" x 4", 10'- 1 1/8" x 2'- 2 1/2", 8'- 11" x 8'- 10'. Which tape rule would be the BEST choice ?

ANSWER: D. 12 feet

POSTTEST

Measure the following lines to the specified graduations. Reduce measures to the lowest terms (i.e., 16/64 = 1/4) and write correct answer on the lines.

1. Measure these lines to the nearest quarter of an inch.

   a. _____

   b. _____

   c. _____

   d. _____

2. Measure these lines to the nearest eighth of an inch.

   a. _____

   b. _____

   c. _____

   d. _____

3. Measure these lines to the nearest sixteenth of an inch.

   a. _____

   b. _____

   c. _____

   d. _____

ANSWER KEY

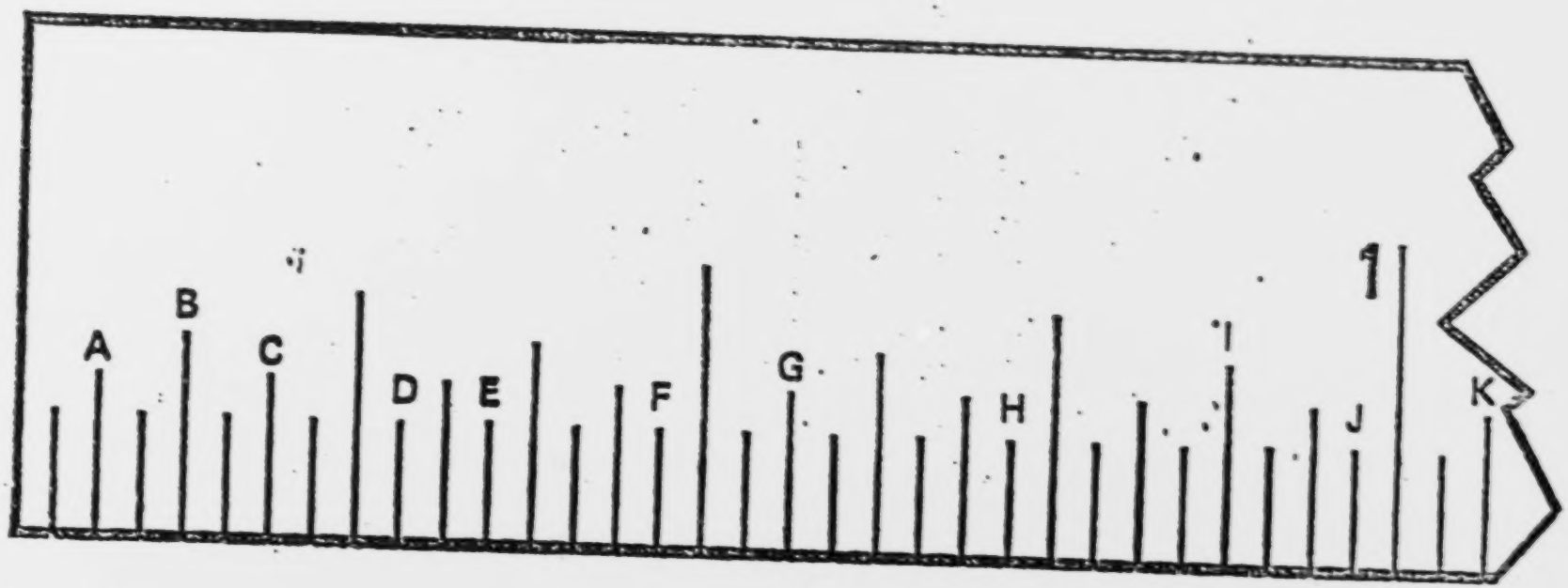
(Teacher's Copy)

1. a. 3 1/4
   b. 4 1/2
   c. 1
   d. 2

2. a. 4 7/8
   b. 2 1/2
   c. 3 5/8
   d. 4 1/4

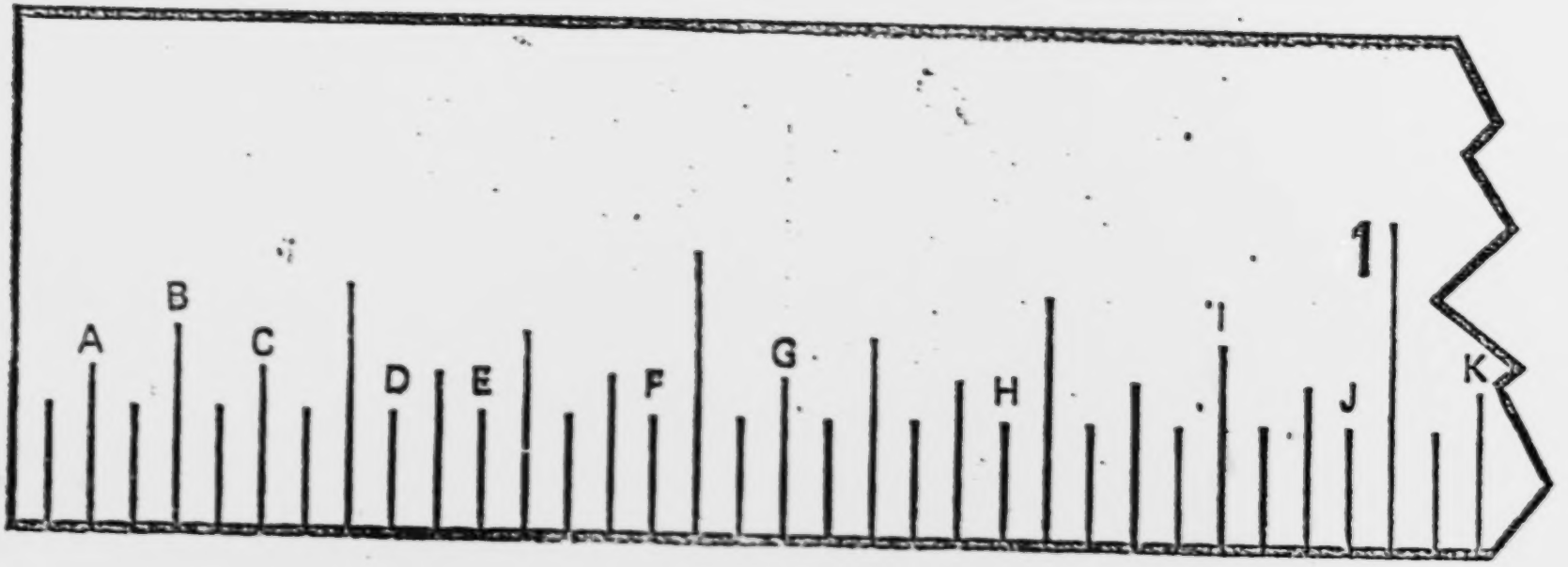
3. a. 4 5/8
   b. 1 1/16
   c. 2 5/8
   d. 3 1/4

Thirty-Second Rule



ANSWER KEY
(Teacher's Copy)

Thirty-Second Rule



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